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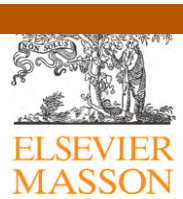

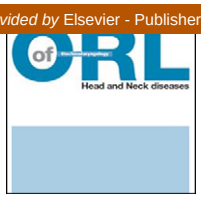

IMAGES, QUESTIONS AND ANSWERS

Dilatation of the vestibular aqueduct and lipiodol

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Imaging case

A 47-year-old woman was referred for an old and isolated deafness of the right ear. The clinical examination demonstrated a negative Rinne test on the right ear and the Weber test was lateralized to the right. It was otherwise normal. The patient had no individual or family medical history. The pure tone audiometry demonstrated a mixed severe hearing loss (Fig. 1) on the right ear (PTA = 71 dB). A scan of the right temporal bone (Fig. 2) and a brain magnetic resonance (Fig. 3) were performed.

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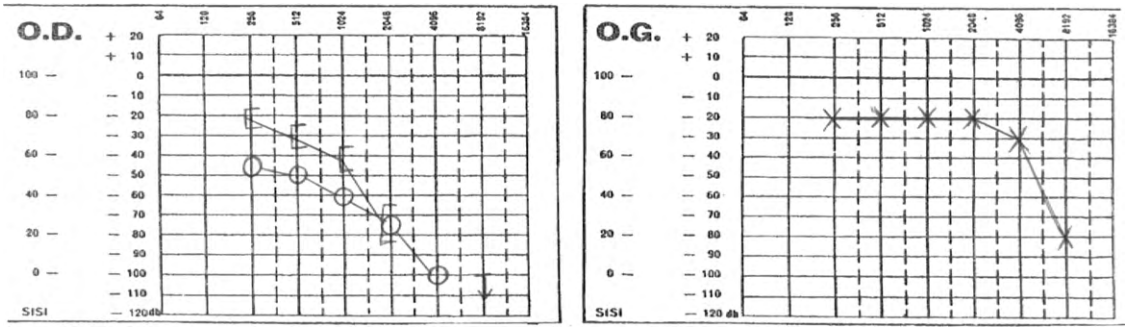

Figure 1 Audiometric study demonstrated a mixed severe hearing loss on the right ear.

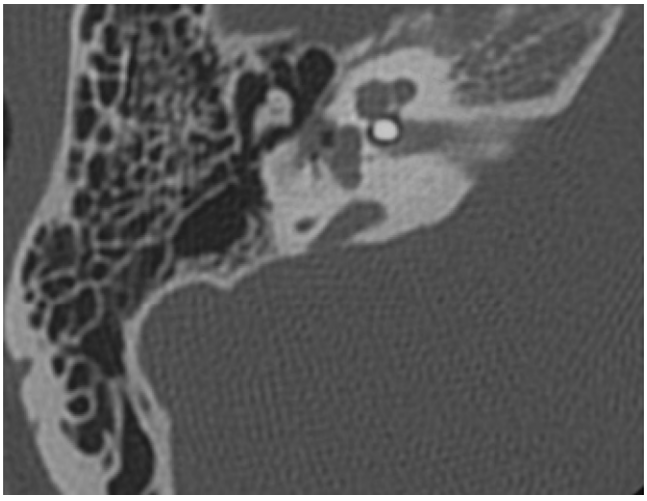

Figure 2 Computed tomography scan on the right temporal bone.

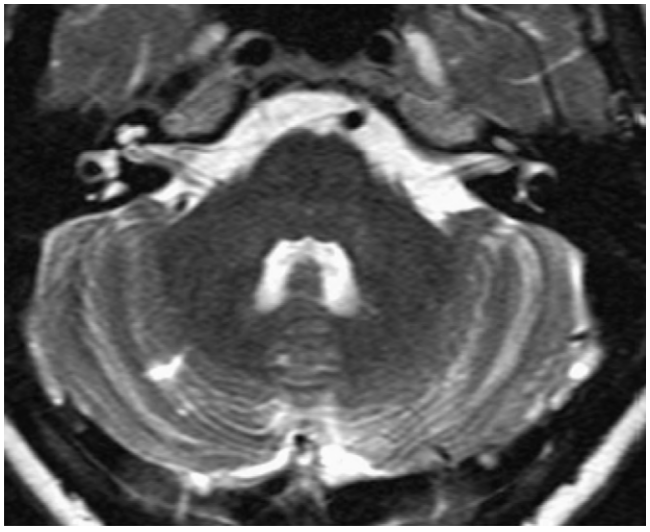

Figure 3 Brain MRI, axial view with CISS sequences.

What is your diagnosis?

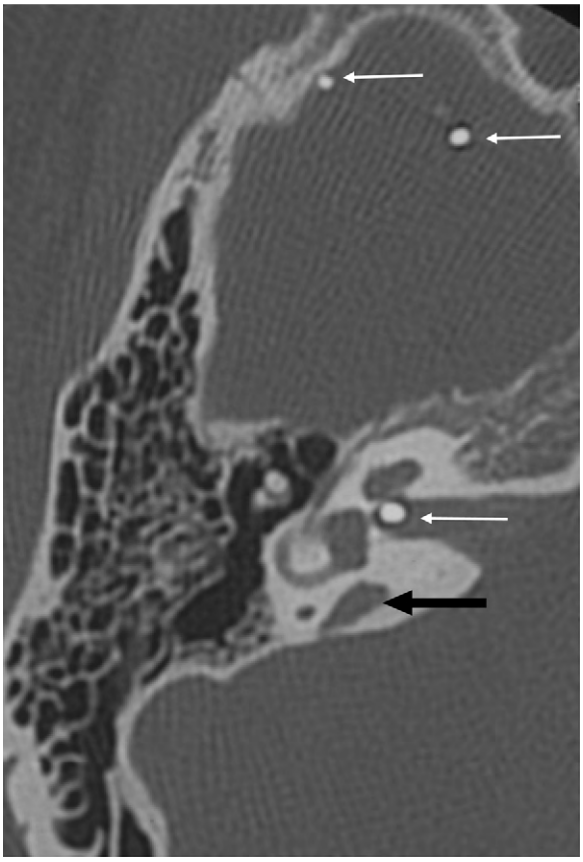

Figure 4 The CT scan demonstrated a homogenous rounded opacity in the bottom of the right internal auditory canal. Two other opacities appear in the right temporal lobe (white arrows associated with a large right vestibular aqueduct (black arrow).

Figure 5 On MRI, the large right vestibular aqueduct is typically hyper intense (white arrow).

Answer

Dilatation of the vestibular aqueduct and lipiodol

The CT scan (Fig. 2) demonstrated a homogenous rounded opacity in the lateral end of the right internal auditory canal. Two others opacities appear in the right temporal lobe (white arrows on Fig. 4). These abnormalities do not explain deafness and seem to be a rest of a lipiodol injection. However, there is a large right vestibular aqueduct syndrome behind the symptoms (black arrow on Fig. 4). On MRI, the large right vestibular aqueduct is typically hyperintense (white arrow on Fig. 5). Large aqueduct syndrome is the most common malformation of the inner ear observed on a CT scan [1]. A large vestibular aqueduct measures more than 1.5 mm in diameter on CT scan and may be unilateral or bilateral. This anomaly is associated with a sensorineural or mixed hearing loss. It may be isolated or a part of a syndromic deafness as in Pendred syndrome. Mostly, there is no vertigo or tinnitus associated and the deafness usually appears during childhood.

The mechanism of the deafness remains unclear. Some authors [2,3] suspect that a large vestibular aqueduct introduces a third mobile window into the inner ear, which can produce an air-bone gap by shunting the sound away from the cochlea. Many other hypotheses are debated like a decrease in stapes mobility, due to an increased endolymphatic or perilymphatic pressure [4].

Clinicians should include large aqueduct syndrome in the differential diagnosis of conductive hearing loss. An accurate diagnosis can be made based on the acoustic reflex and tympanometry which are normal in this syndrome. A CT scan is also necessary in mixed hearing loss to eliminate middle ear diseases such as malleus or stapes fixation, ossicular discontinuity, inner ear malformation (superior canal dehiscence), thereby avoiding negative middle ear explorations. In case of a sensorineural or mixed hearing loss, a brain MRI has also to be performed to eliminate a retrocochlear disease such as acoustic schwannoma.

Conflict of interest statement

None.

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